

DRAFT
DOE TEC Routing Topic Group Working Session
Thursday, February 1, 2007

Meeting Summary

Mr. Jay Jones began the meeting with a welcome and introduction of the topic members, other participants, and support staff. Mr. Jones listed and reviewed all the documents and handouts sent to the topic group members before the meeting.

The documents and hand outs included:

1. **Task Plan-** This document provides information on activities that the topic group may elect to focus on during the topic group's existence. This document can be revised by the topic group as necessary.
2. **Description of Activities-** This document is an outline of the work OCRWM anticipates will be undertaken by the topic group.
3. **Agenda for Routing Topic Group working session**
4. **August 2005 DOE meeting with several railroad entities-** This document summarizes the meeting between DOE and the railroads. As the shipment date gets closer, the railroads will be asked to participate more closely with OCRWM in transportation planning. There will be a follow up meeting with railroads to address issues such as economics, safety and security as it relates to shipping spent nuclear fuel and high-level radioactive waste to the Yucca Mountain repository.
5. **Matrix of Factors for Identifying Routes to Ship Radioactive Materials-** This document can be used as an aid to help the topic group select criteria. It also may be possible to create a formula for a set of criteria. Ruth Weiner will be presenting information regarding weights on criteria.
6. **Definition of a "Suite of Routes"-** Mr. Jones provided this definition to the topic group via e-mail. The definition is as follows: A suite of routes is a set of potential routes that could be used on a national basis for shipments of spent nuclear fuel and high-level radioactive waste that can be conducted safely, securely and efficiently. The suite is comprised of one or more route(s) from multiple origin sites to a specified destination site (via either rail, highway and waterway) based on criteria developed with input from program stakeholders. Once the suite of routes are identified, DOE/OCRWM will have several alternates from which to select. Similar to the Foreign Research Reactor program, as the actual shipment date approaches, RW would be able to make a selection for the specific route to be used for that shipment to Yucca Mountain."

Suite of Routes Definition Discussion

Upon hearing DOE's definition of a suite of routes, there were several comments made by the topic group members. One member stated that the suite of routes concept does not work in Nevada as there are only currently two routes that are viable in Nevada. The member further stated that it appears that DOE will identify several routes and then pick a route when it is time to ship. The state of Nevada's position is to identify a suite of

routes which consists of one preferred route and one backup route from each site to Yucca Mountain.

Another member stated that DOE's definition of a suite of routes is not definitive enough and is not what the topic group members have been asking for over the last eighteen months. Identifying a suite of routes should be part of the planning process. For 180 (c) purposes there should be one primary route and one secondary route from each site to Yucca Mountain. Other members added that it is difficult to talk about routes when the purpose of the suite of routes has not been decided and the rationale behind the suite of routes has not been explained. A member asked why DOE is not able to state that there will be two routes: a northern route and a southern route.

Mr. Jones stated that he agreed with the topic group members regarding the need to do planning for the suite of routes. However, the suite of routes is a national suite and not local routes. Issues such as route proximity to one another will be developed as the topic group progresses in identifying the routes. Topic group members continued to reiterate that there are not numerous suites of routes available for selection. One member from the Northeast stated that there are two choices for routes in the Northeast which consists of a northern route and a southern route available to access the main route.

One member suggested that DOE use language similar to what the CSG-Northeast used in their presentation on routing. The Northeast referred to the first leg as the route from the site to the first choice point and the second leg as the route from the first choice point to consolidated routes. This member asked Mr. Jones if DOE wanted to consider consolidating routes which involves shipping materials from different sites to one route. Another member responded by stating that there are a lot of unknowns and uncertainties regarding consolidating routes. Shipping casks may not be available for consolidating. In addition, utility companies decide when to ship what they want to ship. A basic decision has to be made by DOE on whether there will be consolidation for routing. This decision in turn affects the amount of rolling stock to be purchased and the amount of shipments to be made.

One member commented that as the actual shipment date approaches, it is impractical for DOE to ship via a mostly rail scenario. To have the most secure shipment, one would have to give up the mostly rail option and consider using truck transportation. In addition, some operational decisions may need to be made before any routing decisions can be made.

One member asked why the availability of casks would affect the consolidation of routes. Judith Holm, DOE/RW, responded the availability of casks would not affect route consolidation. There will be enough hardware for the routes. Ms. Holm suggested that the topic group approach routing from a regional perspective.

Gary Lanthrum, DOE/RW, commented that DOE is not expecting the topic group to select a suite of routes from each origination site. DOE is interested in operational flexibility and determining where it makes sense to cross-connect routes. DOE would like to get the topic group's perspectives on local implementation. One member commented that there are too many routes to be considered regarding 180 (c) funding

allocations. The program has cost restrictions. Mr. Lanthrum responded that there will be a very high cost because of the number of routes.

Another member asked Mr. Lanthrum to clarify whether DOE is going to have a consolidation point for routes. Mr. Lanthrum responded that the majority of the shipments will be from the origination sites to Yucca Mountain. Some marshalling yards may be used. Ruth Weiner of Sandia National Laboratories commented that there may be more than sixty five hundred shipments with no fewer than fifty from each site.

One member commented that there are two major DOE NEPA projects currently in progress. This member also asked how does DOE's NEPA responsibilities relate to routing and does DOE need to consider regional equity. Mr. Lanthrum responded that the focus of the topic group should be perspectives and input on routes. Another member commented that the topic group may be making the suite of routes issue too complicated. It was suggested that the topic group allow Paul Johnson to do his presentation regarding TRAGIS, present this presentation to the railroads and get their operational perspective on criteria, and lastly, present these findings to the topic group. Another member asked what product does DOE want from the topic group. Mr. Lanthrum responded that DOE would like the number of routes that would accommodate shipments from the origination sites to Yucca Mountain.

One member recommended that the topic group evaluate what is important and how the topic group wants to define a successful planning process. Mr. Lanthrum commented that the topic group should not expect complete consensus on criteria.

Routing Criteria Discussion

[The preceding discussion evolved into a routing criteria discussion.]

One member expressed concerns that there are limited routes available and that certain routes are preferred by railroads. The topic group could be wasting their time by trying to select criteria if routes have already been selected by the railroads.

Another member stated that regardless of the starting point for the routes, one criterion could be that marshalling yards need to be located along the routes. In addition, the "leg" concept that the Northeast proposed in their routing approach should be part of the criteria model. Other items that need to be addressed before selecting criteria include defining a planning process and selecting routes. Mr. Lanthrum commented that the topic group's approach to review what routes CSG-MW and CSG-NE had already proposed was fine with DOE.

One member suggested the topic group discuss two or three fundamental criteria and then review routes by applying these fundamental criteria. This would allow the topic group to review routes early in the process. Mr. Jones suggested that over the next few months the topic group review criteria and have a workshop in April or May 2007 using TRAGIS and RADTRAN.

Task Plan Schedule/Comments on Task Plan

In regards to the Task Plan schedule, Mr. Jones stated that he envisions having draft criteria completed by the topic group in time for an April 2007 conference call. The final criteria would be selected by the May 2007 conference call. At the next TEC meeting in July 2007, the Routing Topic Group would meet for at least one-half day and have routes generated by Paul Johnson using TRAGIS. One member commented that there are regional criteria for the first leg of a route and there are national criteria for the common routes. Mr. Jones responded that the topic group will be focusing on the national routes.

One member had the following comments on the Task Plan:

- On page 1, under Objectives, second line, the words "...responsible consideration of..." should be removed.
- On page 1, under Objectives, at the end of the sentence, the wording "...for safe, secure, and efficient shipments to Yucca Mountain" should be reworded to say "...to reflect safe, secure, and efficient shipments to Yucca Mountain and merit public confidence."

TRAGIS Presentation

Mr. Paul Johnson gave a presentation showing how to develop a set of rail routes from a specific reactor site to the Caliente Corridor entry point to Yucca Mountain. For this presentation, the H. B. Robinson site in South Carolina was used. Using TRAGIS, routes were calculated with both "manifest" and "dedicated" route types. Several different routes were presented and various criteria such as travel time, distance, track class, number of urbanized areas crossed by routes, population within a 2.5 km buffer of routes, Tribal land along routes, traffic density, passenger operations along routes, and track characteristics were compared.

One member asked if the travel time included switch yards and inspections. Mr. Johnson responded that for each route, TRAGIS determined an estimated rail travel time based on an assumed speed for each of the seven different traffic density levels in the rail network database, a delay factor for switching between railroads, and a delay factor for crew change locations. Another member asked how time is validated. Judith Holm responded that models can be made to do what one wants and this is why criteria are important.

One member asked if state recognized Tribes in the East and South are considered in this model. Mr. Johnson responded that TRAGIS identifies or acknowledges all Federally recognized Tribes. Any Tribal entity that is waiting to be considered a "trust" or Federally recognized is not included in the model. In addition, the 2000 Census is used for population data. Mr. Johnson further explained that some of the information for this routing example is taken from the railroad system time tables which is proprietary and cannot be released to the public.

Risk Assessment and Consequence Analysis using RADTRAN

Dr. Ruth Weiner gave a presentation on risk assessment and consequence analysis using RADTRAN. There is a concern that the public is exposed to radiation during routine

transportation. One example analyzed exposure to passing rail crews and rail yard workers. The example scenario had the following assumptions for the rail yard worker:

- 4 spent fuel rail cars all at the regulatory limit
- Stop in rail yard is for 10 hours
- Rail yard has 20 people
- All personnel are between 3 to 400 meters of cask

The person-rem amounts are very small. Most routes are rural with sparse populations. Urban areas have buildings which provide better shielding. Suburban areas have larger populations with a small amount of shielding.

Dr. Weiner also presented an analysis on a non-radiological accident risk. For this analysis, the rural areas have a higher probability for accidents; however, there has never been a fatality caused by radiation exposure during transportation of spent nuclear fuel.

Dr. Weiner explained concepts related to dose risk. Dose risk is determined based on the probability of what accidents are likely to happen. The most likely accident is determined from this probability, and from that determination a release can be estimated. Ground shine is the dose on the ground that emits gamma radiation. Cloud shine has material suspended in air around the person, emits radiation and is external only. Inhalation rate is a 50-year exposure rate. Societal Ingestion Dose includes a total population dose and can be determined by taking a fraction of the agricultural land in the states affected and using criteria such as soil type, weathering, and dilution by animals. Population dose risk is dependent on state accident rates, number of miles in each region, and population. This would occur only if an accident results in a release.

One member asked if one is to assume the dose risk is a 24-hour dose. Dr. Weiner responded that is correct. In addition, all agricultural areas except cotton are assumed to be for human consumption. One member asked if there are incident rates for current shipments. Dr. Weiner responded that there are not any incident rates for current shipments but the RADTRAN user can input any incident and/or accident rate. The rates are per rail car. Dr. Weiner hopes to show the RADTRAN decision analysis capability in more detail at the tentatively scheduled workshop in April or May.

Mr. Kevin Blackwell commented that the FRA has a companion model to TRAGIS called the Railroad Routing Visualization Application (RRVA). It is a relatively new program and is currently being used only by FRA employees. However, Mr. Blackwell suggested that the topic group may want to be able access it for their use.

Naval Nuclear Propulsion Program-Past Shipping Campaigns

Mr. Ray English presented the naval spent fuel shipment routing experience. For this program, the rail shipper has the right to designate carriers and interchanges. However, the railroads need flexibility to route on their system as dictated by operational requirements. Routing flexibility for rail carrier translates to operationally safe and secure movements. Miles are minimized by trying to take as direct a route as possible. This helps gain public acceptance when less miles are traveled. One member asked if

stakeholder input had been allowed. Mr. English responded that stakeholder input had been considered for designating routes.

General Comments/Questions and Answers

A Tribal member commented that there had been a rail related accident on a reservation in which emergency personnel from the Tribe were told to leave the accident and not participate in the emergency response. Mr. Jones responded that he was unaware of that particular incident and reiterated that DOE is trying to provide a mechanism for emergency response training via the 180 (c) grant program.

One member asked Mr. English if he would add or change anything to the NNPP's routing program. Mr. English responded that he would not necessarily add or change any criteria but a starting point for the routing topic group might be to consider minimizing miles and interchanges (i.e., "handoffs") as criteria for routes. Dr. Weiner suggested that the topic group consider exposure to inspectors as a possible criterion.

Action Items

1. Schedule a telecon with topic group
2. Decide if TRAGIS/RADTRAN workshop is necessary on next telecon. If necessary, decide date and place of workshop
3. Members have requested a more definitive definition for "suite of routes"
4. Start criteria development (next telecon?)